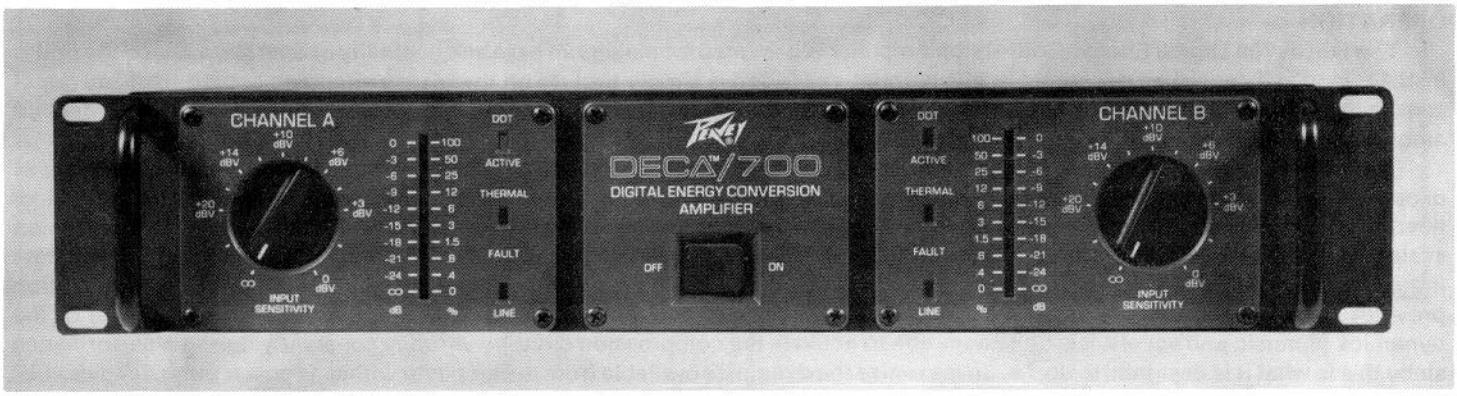
DECA™ 700

STEREO DIGITAL ENERGY CONVERSION AMPLIFIER

Operating Guide



CAUTION
TO PREVENT ELECTRICAL SHOCK OR FIRE HAZARD, DO NOT EXPOSE THIS INSTRUMENT TO RAIN OR MOISTURE.
BEFORE USING THIS INSTRUMENT, READ BACK COVER FOR FURTHER WARNINGS.

GENERAL DESCRIPTION

The DECA 700 provides an innovative approach to audio amplification by utilizing Digital Energy Conversion technology, the result of a dedicated effort to merge the advantages of high-speed digital computer electronics, high-efficiency semiconductor devices and electro-magnetic energy conversion technology. The amplifier system has been designed for commercial duty amplification where performance, reliability and long life are foremost requirements. Professional design, specifications and in-process quality checks combine to produce an amplifier with outstanding performance at a reasonable price.

This compact powerful system features a digital version of Peavey's DDT™(Distortion Detection Technique) compression circuitry that electronically senses increased distortion levels well in advance of clipping and engages a specially designed circuit which virtually eliminates the possibility of driving the amplifier into distortion beyond approximately 1.0% THD. This DDT compression circuit may be disengaged on each channel independently if desired via the slide switches on the rear panel.

The DECA 700 amplifier is a highly efficient (approximately 90% at all output levels) power transfer system capable of delivering up to 350 Watts RMS per channel continuously to a 4 ohm load without the use of massive heat sinks or forced air cooling to insure low operating temperatures in any given environment. In the event of abnormal load conditions or inadvertent misuse, the system is equipped with complete and independent thermal, short-circuit and overload conditions to protect against amplifier system failure. In addition, the DECA 700 has built-in protection circuitry in each channel to instantaneously sense any hazardous output conditions which might harm speaker systems. The advent of abnormal D.C. voltages on the output terminals engages special output protection circuitry which disconnects the channel output from the speaker load until the fault is corrected. All thermal, short-circuit and output line faults have corresponding LED indicators on the front panel.

As a home hi-fi amplifier, the Peavey DECA 700 is an unmatched stereo power amp. However, a word of warning should be given concerning the choice of the speaker system used. A true 350 watts per channel can easily overpower many home loudspeaker systems.

The operation of the DECA 700 is essentially straight forward and will present no difficulties in most applications. Our exclusive DDT compression circuitry enables the total system to enjoy freedom from most of the commonly encountered headroom problems with power amplifiers. The DECA 700 is another step in the continuing struggle to provide one of the most competitive professional power amplifiers on the market on a dollar-per-watt/performance basis. Professional specifications, components, the latest semiconductors and contemporary design make the DECA 700 the obvious choice for demanding commercial/professional applications. Comparison of performance, features, construction, techniques, and quality of components with any of its competition will illustrate the excellence of this professional amplifier.

The new DECA 700 system is a stereo Digital Energy Conversion unit capable of high-efficiency energy transfer to various speaker load configurations with professional performance specifications. The Energy Conversion system is rated at 350 watts RMS per channel (both channels driven) into a 4 ohm load with less than 0.1% Total Harmonic Distortion and features a modified version of Peavey's patented DDT compression circuitry to minimize distortion due to clipping at the maximum energy transfer levels. Due to the nature of the design of the amplifier system, no transient intermodulation distortion can be introduced by the unit, even with very complex signals and at high signal levels.

INSTALLATION AND CONNECTION

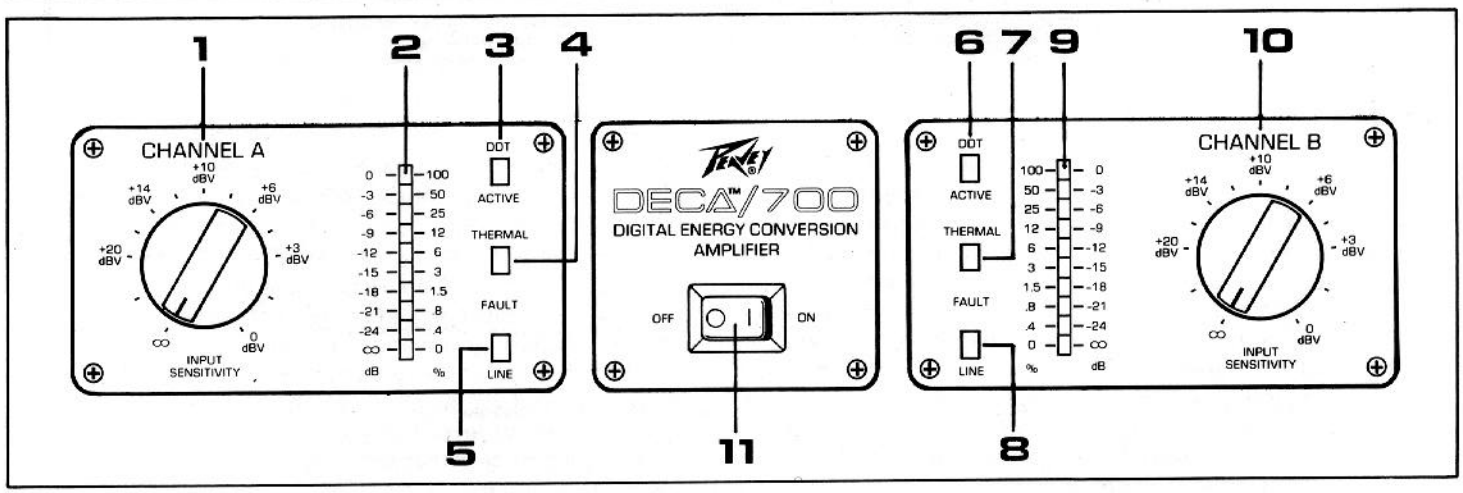
The Peavey DECA 700 digital energy conversion amplifier is designed for durability in commercial installations and high quality performance in studio and home applications. The DECA 700 is a dual channel power amplifier with each channel capable of delivering more than 350 watts RMS into a 4 ohm load. The amplifier is of the standard 19" rack mount configuration and does not require forced air cooling to alleviate any abnormal thermal conditions. Where sustained high power operation is required, the amplifiers should be mounted in a standard 19" rack with one rack space (1¾") between each amplifier in the stack. **Note:** Under no circumstances should the amplifier be operated while sitting on a flat surface without the supplied rubber feet since the amplifier requires proper ventilation for convection cooling. As a general rule, the cooler electronic equipment is operated, the longer its useful service life. You have invested in the finest equipment that money can buy and a little care will insure long and reliable operation. Most applications allow the amplifier to be mounted in any configuration and require no special considerations for abnormal thermal situations. However, an inadvertent short circuit or sustained high power usage could cause the internal thermal protection circuitry to engage. This situation is indicated by the front panel thermal fault indicators.

All input and output connections are made at the rear panel jacks. A discussion of the purpose and use of each of the rear panel jacks is provided in the "Rear Panel: Operation" section of the manual.

OPERATION

The DECA 700 Digital Energy Conversion Amplifier is designed for maximum ease and flexibility of operation. When the unit is installed and connected as described in this manual, operation is simply turning on the main switch and setting the front panel sensitivity controls for the desired output level or until the front panel LED array indicates that the amplifier is delivering the desired amount of power.

The DDT compression system enables the user to maximize the performance of the amplifier/speaker combination. Years of experience and research have determined compression circuitry should prevent the power amplifier from running out of headroom (clipping) and should be as simple to operate as possible to avoid undue complication for the user. The compression system is activated by an exclusive "Distortion Detection Technique" circuit (DDT™) that senses conditions which indicate increased distortion well in advance of clipping and activate compression to prevent system overload. This unique implementation provides for the optimum power output with minimal distortion and with an increased dynamic headroom. Because of the dynamics of music and vocals, it is quite common to activate the compression circuitry virtually constantly during a performance since this is what it is designed to do, i.e., to maximize the dynamics available from the amplifier within its power output capabilities regardless of power supply/line voltage variations and load impedance selection.



FRONT PANEL

(1,10) Channel A and Channel B Input Sensitivity Control - The input sensitivity controls for each channel act as a master volume control permitting adjustment of the overall system gain to minimize hum and noise and still provide adequate headroom. The numbered dial indicates the sensitivity in volts necessary to attain full power with the control in that position. In the full clockwise position, the relative sensitivity is approximately 1.0 volts RMS (or 0 dBv) for full output power.

(2,9) The LED array indicators provide a visual display of the output power of the individual amplifiers in both "percent of total power" and "available headroom." The bottom LED of each array will remain lit when A.C. power is applied to the amplifier and the amplifier is operation in the stereo mode. This will serve as a "Power On" indicator for the unit. When the amplifier is switched to "Bridge Mode," on the rear panel, the Channel B LED will no longer be lit, indicating that the operative control is now Channel A.

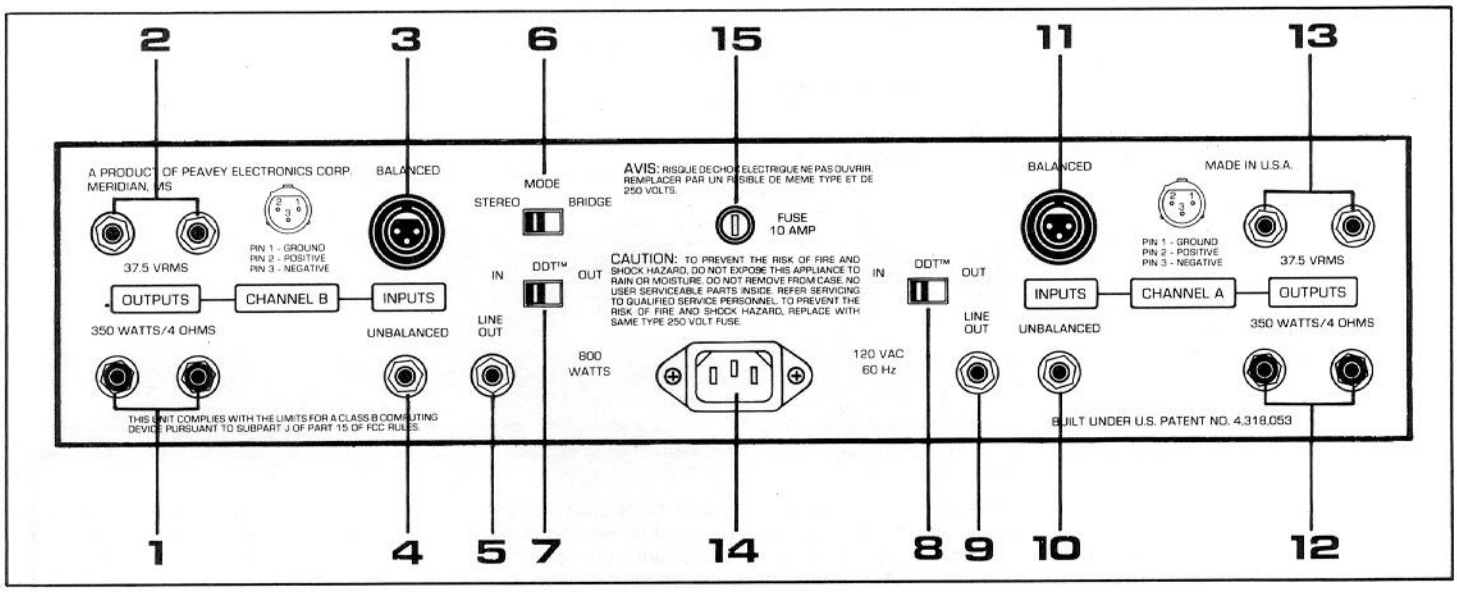
(3,6) The DDT™ Active indicators provide a visual display of the compression operation. As long as gain reduction is occurring, the LED will continue to light, thereby giving a valuable indication of this unique compression function. The DDT™ compression may be defeated on each channel separately with the DDT™ Defeat Switch (7,8) on the rear panel. When the DDT™ compression is defeated, the front panel DDT™ indicator will no longer light, indicating that the DDT™ compression is no longer working. Care should be taken when this condition exists, since the amplifier can now be severely overdriven and much higher levels of power are available at the output jacks. This condition could be harmful to speaker systems.

(4,7) The Thermal Fault indicators provide a visual display of any interruption in operation due to thermal overload on either amplifier. Under normal operation, this condition is highly unlikely. However, abnormal load conditions for extended periods of time could cause the amplifier to temporarily disengage. Each channel is independent and separate, and, should a single channel overload thermally, the other channel will continue to function normally.

(5,8) The Line Fault indicators provide a visual display of any temporary interruption in each channel due to an output line fault (e.g., short circuit, D.C. voltage, transient suppression, over-current). The Line Fault indicators for each channel are independent

and will remain lit as long as the fault exists. The fault protection circuitry will automatically restart approximately 4 seconds after the fault is cleared. It should be noted that since the amplifier protects against any turn-on transients, the Line Fault indicators will remain lit for approximately 4 seconds after A.C. power is applied to the amplifier. At this time, the Line Fault condition will be cleared and the line outputs will be enabled.

(11) The "ON/OFF" Switch is located on the front panel and is used to apply the A.C. mains power to the unit. When the amplifier is plugged into a suitable power source, activating this switch should light the lower LEDs on each channel's LED arrays. Failure of the LEDs to light may indicate the line fuse is blown or the power source is faulty.



REAR PANEL
OUTPUT SECTION

Two types of output connections are provided on the rear panel of the power amplifier modules. The"Binding Post" outputs (1,12) of each channel of the amplifier are connected in parallel with the two "Phone Jack" outputs (2,13) of each channel of the amplifier. The minimum suggested load for the total parallel combination for each channel is 4 ohms. Care should be taken when lower impedance loads are used due to increased power demand placed on the amplifier. The amplifier is capable of delivering in excess of 350 watts RMS from each of these channel modules into 4 ohms. When operating in "Bridge Mode," the "Red" binding post of each channel should be used as the output, and the signal source should be driven into the Channel A input.

Due to the high currents at full output, it is recommended that No. 16 or larger wire be used whenever possible. Smaller wire sizes will waste power and yield less than optimum performance. It is also suggested that in commercial and other non-portable applications, the binding posts (1, 12) be used instead of the 1/4"phone jacks. The binding posts are an industry standard and mating "banana plugs" are available from most electronic distributors. As with all electronic equipment, proper phasing of the outputs is important. A little time spent in correctly identifying the wiring could alleviate a lot of problems in the field.

INPUT SECTION

All input connections are made at the rear panel jacks. Shielded cables should be used to minimize hum and noise pickup. The nominal input impedance is 50K ohms, representing a bridging load to professional equipment and compatible with home stereo devices. The DECA 700 has an input sensitivity of 1.0 volts RMS (or 0 dBV) for rated output with the input sensitivity controls set at 0 dBV. This sensitivity decreases as the control is turned counterclockwise (CCW).

(3,11) The Balanced input "XLR" connectors provide an electronically balanced input capability for truly differential input signals.

(4,10) The Unbalanced input phone jack connectors provide a single ended input when balanced input is not required.

(5,9) The Line Out connector is provided for ease in connecting several amplifiers in parallel without the use of Y-type connections.

(6-B side only) The Mode switch is provided to select either Stereo Mode or Bridge Mode operation. Under normal operating conditions the Mode Switch should be in the "Stereo" position. Unless the amplifier is to be used in a commercial sound distribution (70-Volt line) system, the bridge mode should not be used. When in Bridge Mode, the "Red" binding posts on either side should be used as outputs, the Channel A inputs should be utilized and the Channel A Input Sensitivity control is the active control. It should be pointed out that for proper operation, both wires of the output must "float" above ground.

(7,8) The DDT™ compression defeat switch is utilized to disengage the DDT™ compression on each channel separately. It should be noted that with DDT™ disengaged, the power output can exceed 450 watts* per channel. (*At slightly higher distortion)

The DECA™ 700 power connector (14) is a heavy-duty IEC-type with a conventional A.C. plug with a ground pin. It should be connected to a circuit capable of at least 15 amps continuous, or greater. If the socket used does not have a ground pin, a conventional adapter should be used and the third wire grounded properly. Never break off the ground pin on a line cord of the DECA™ 700. The use of extension cords should be avoided, but if necessary, always use a three-wire type with at least a No. 16 wire size. The DECA™ 700 is fused with a standard 10-amp fuse (15). Always replace with the same type and rating. Failure to do this could void the warranty.

SPECIFICATIONS

FREQUENCY RESPONSE:
5 Hz to 20 kHz, +0/–1 dB @ 350 Watts into 4 ohms
–3 dB @ 40 kHz, 350 Watts into 4 ohms, limited by Bessel input filter.

INSTANTANEOUS AVAILABLE POWER

(Headroom):
350 Watts RMS per channel into 8 ohms
550 Watts RMS per channel into 4 ohms

RATED POWER OUTPUT:*
350 Watts RMS per channel into 4 ohms with less than 0.1% Total Harmonic Distortion (Both channels driven)
450 Watts RMS per channel into 4 ohms with less than 0.3% Total Harmonic Distortion (Both channels driven)
700 Watts RMS into 8 ohms (In bridge mode)

TOTAL HARMONIC DISTORTION:*
Less than 0.1% (Typically below 0.06% THD) @ 350 Watts RMS per channel into 4 ohms
Less than 0.3% @ 450 Watts RMS per channel into 4 ohms

TRANSIENT INTERMODULATION DISTORTION:
None Present -- 0% TIM

OUTPUT SLEW RATE:
The amplifier output slew rate is internally controlled to optimize phrase linearity and improve transiet response. Due to the nature of the amplifier design and the internal signal conditioning circuitry, it cannot slew-rate limit.

HUM & NOISE:
Greater than 95 dB below full power (20 Hz to 20 kHz)

INPUT SENSITIVITY:
1.0 V RMS for 350 Watts into 4 ohms

LOAD PROTECTION:
Relay protected at each output with instantaneous turn off and 4 second turn on delay to prevent unwanted system transients. Complete digital control shut-down activation for both amplifier protection and positive speaker protection.

THERMAL:
Independent automatic thermal channel shut-down with front panel indicators.

LOAD IMPEDANCE:
4 Ohms or greater (unconditionally stable into any load configuration or any signal condition and level at the input)

FRONT PANEL:
10 segment LED arrays indicating stand-by status and percent power output level
DDT™ LED activation indicators
Thermal Fault LED activation indicators
Output Line Fault LED indicators (short circuit, DC, etc.)

POWER CONSUMPTION:
800 Watts, 120 VAC, 50/60 Hz (domestic model)

DIMENSIONS:
19" W x 3.5" H x 13.5" D

WEIGHT:
30 lbs.

***DDT Disabled, measured at 1 kHz**

The DECA 700™ is manufactured under U.S. patent #4,318,053 and five patents pending.

Due to our efforts for constant improvement, features and specifications are subject to change without notice.

CLASS B COMPUTING DEVICE: INFORMATION TO USER

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate the equipment with respect to the receiver
- move the equipment away from the receiver
- plug the equipment into a different outlet so that the equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio-television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the US Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

DANGER

EXPOSURE TO EXTREMELY HIGH NOISE LEVELS MAY CAUSE A PERMANENT HEARING LOSS. INDIVIDUALS VARY CONSIDERABLY IN SUSCEPTIBILITY TO NOISE INDUCED HEARING LOSS, BUT NEARLY EVERYONE WILL LOSE SOME HEARING IF EXPOSED TO SUFFICIENTLY INTENSE NOISE FOR A SUFFICIENT TIME.
THE U.S. GOVERNMENT'S OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAS SPECIFIED THE FOLLOWING PERMISSIBLE NOISE LEVEL EXPOSURES:

DURATION PER DAY IN HOURS	SOUND LEVEL dBA, SLOW RESPONSE
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

ACCORDING TO OSHA, ANY EXPOSURE IN EXCESS OF THE ABOVE PERMISSIBLE LIMITS COULD RESULT IN SOME HEARING LOSS.
EAR PLUGS OR PROTECTORS IN THE EAR CANALS OR OVER THE EARS MUST BE WORN WHEN OPERATING THIS AMPLIFICATION SYSTEM IN ORDER TO PREVENT A PERMANENT HEARING LOSS IF EXPOSURE IS IN EXCESS OF THE LIMITS AS SET FORTH ABOVE. TO INSURE AGAINST POTENTIALLY DANGEROUS EXPOSURE TO HIGH SOUND PRESSURE LEVELS, IT IS RECOMMENDED THAT ALL PERSONS EXPOSED TO EQUIPMENT CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS SUCH AS THIS AMPLIFICATION SYSTEM BE PROTECTED BY HEARING PROTECTORS WHILE THIS UNIT IS IN OPERATION.

CAUTION

THIS AMPLIFIER HAS BEEN DESIGNED AND CONSTRUCTED TO PROVIDE ADEQUATE POWER RESERVE FOR PLAYING MODERN MUSIC WHICH MAY REQUIRE OCCASIONAL PEAK POWER. TO HANDLE OCCASIONAL PEAK POWER, ADEQUATE POWER "HEADROOM" HAS BEEN DESIGNED INTO THIS SYSTEM. EXTENDED OPERATION AT ABSOLUTE MAXIMUM POWER LEVELS IS NOT RECOMMENDED SINCE THIS COULD DAMAGE THE ASSOCIATED LOUDSPEAKER SYSTEM. PLEASE BE AWARE THAT **MAXIMUM POWER** CAN BE OBTAINED WITH VERY LOW SETTINGS OF THE **GAIN** CONTROLS IF THE INPUT SIGNAL IS VERY STRONG.

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be retained for future reference.
3. Obey all cautions in the operating instructions and on the back of the unit.
4. All operating instructions should be followed.
5. This product should not be used near water, i.e. a bathtub, sink, swimming pool, wet basement, etc.
6. This product should be located so that its position does not interfere with its proper ventilation. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
7. This product should not be placed near a source of heat such as a stove, heater, radiator or another heat producing amplifier.
8. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
9. Never break off the ground pin on the power supply cord. For more information on grounding write for our free booklet "Shock Hazard and Grounding."
10. Power supply cords should always be handled carefully. Never walk or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
11. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
12. Metal parts can be cleaned with a damp rag. The vinyl covering used on some units can be cleaned with a damp rag, or an ammonia based household cleaner if necessary.
13. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.
14. This unit should be checked by a qualified service technician if:
    A. The power supply cord or plug has been damaged.
    B. Anything has fallen or been spilled into the unit.
    C. The unit does not operate correctly.
    D. The unit has been dropped or the enclosure damaged.
15. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.

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